

DataGloveTM Model 2+

VPL



Key Features

- Natural 3D User Interface
- Senses Gestures, Orientation, and Position of the Hand
- Easy to Program
- Interfaces to Any Computer System
- Can Be Synchronized for Two-Handed Use

Description

The DataGlove Model 2+ is a patented computer input device which converts hand gestures and positions into computer-readable form. The DataGlove system consists of the DataGlove and a desktop control unit.

Optical fiber sensors mounted on a lightweight lycra glove monitor flexion and extension of the fingers while a magnetic sensor measures the position and orientation of the hand.

The microprocessor-based control unit acquires data from the DataGlove and transmits it to the host.

VPL Research supplies test and calibration software with each DataGlove Model 2+.

Applications

The DataGlove opens up new ways of interacting with computers:

CAD/CAM

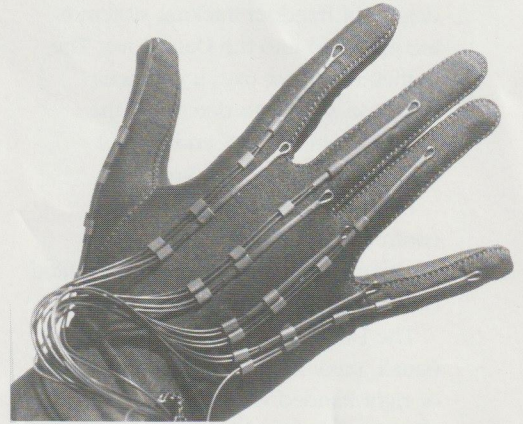
The DataGlove is an ideal input device for manipulating dynamic 3D design environments. Users can grasp objects on the screen in the same manner that they would in the real world.

Robotics and Telem Manipulation

Robot arms and grippers can be manipulated in real time by the DataGlove for training or telem Manipulation. Gestures can be used to command the robot.

Simulation

The DataGlove can be used to generate control data in order to incorporate a user's hand gestures and motions in a simulation.



Animation

Computer-generated characters can be puppeted by mapping DataGlove sensor values to character limbs or actions.

Biomedical

Hand function and performance can be assessed.

Hearing Impaired

The DataGlove can be used for research into sign language.

Key Features

Natural 3D User Interface

The DataGlove allows the user to work with computer-generated objects in the same way he/she would work with real objects, by reaching, touching, and grabbing them. Command languages can be implemented using gestures instead of keystrokes.

Typically, systems use a computer animated hand which mimics the user's hand to manipulate objects. This, coupled with gesture commands, allows selection and action to be performed in one step, without using modes.

Senses Gestures, Position and Orientation of the Hand

VPL's proprietary fiber optic sensors measure flexion and extension of the ten major joints of the hand on a standard DataGlove. Sensors which measure abduction and the minor joints are available as an option.

A Polhemus 3Space Isotrak™ 6 degree of freedom tracking system is incorporated into the DataGlove. The Polhemus sensor uses a magnetic detection system to determine the hand's position (X, Y and Z) and orientation (Yaw, Pitch and Roll).

Bend information is sent to the control unit via a fiber optic cable; position and orientation are transmitted by a separate electrical connection.

The DataGlove comes in three sizes (small, medium or large) in left-handed or right-handed versions. The DataGlove can be used by any user with a properly fitted glove. Calibration data for each user can be downloaded into the control unit.

Easy to Program

The DataGlove is controlled by the host via a set of 25 commands. Data records can be customized to include specific sensor values in any order. Records can be sent at regular intervals (30 or 60 per second) or on demand.

VPL supplies the C source code of a driver to serve as a guide for programmers developing their own interface routines.

Interfaces to Any Computer System

The DataGlove supports interfaces to host computers via RS-232 and RS-422 serial communications.

Can Be Synchronized for Two-Handed Use

Two DataGlove Model 2+ systems can be synchronized for two-handed applications by connecting the control units with a Dual System Synchronization package. In this mode, the data for each hand is handled by a separate control unit and two host communications channels are required.

Specifications

Joints Measured

Metacarpophalangeal joints of five fingers, the interphalangeal joint of the thumb and the proximal interphalangeal joints of the other four fingers.

Angular Resolution

1 degree

Hand Spatial Measurement

Position (X, Y, and Z) and orientation (Yaw, Pitch, and Roll) for a total of 6 degrees of freedom

Position and Orientation

Measurement Accuracy (at 15 inches)

0.13 inches RMS

0.85 degrees RMS

Data Acquisition Rate

60 times per second

Data Communications Interface

RS-232 and RS-422 (user selectable from 300 to 38,400 baud)

Data Transfer Rate

30/second, 60/second, or on demand

Operating Temperature

10°C to 50°C at relative humidity of 10% to 80%, noncondensing

Operating Environment

The six degree of freedom tracking system should not be used in the presence of ferrous objects or strong electromagnetic fields.

Power Requirements

110 VAC, 50-60 HZ, less than 100 watts.



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